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(54) **ELECTRIC VEHICLE**

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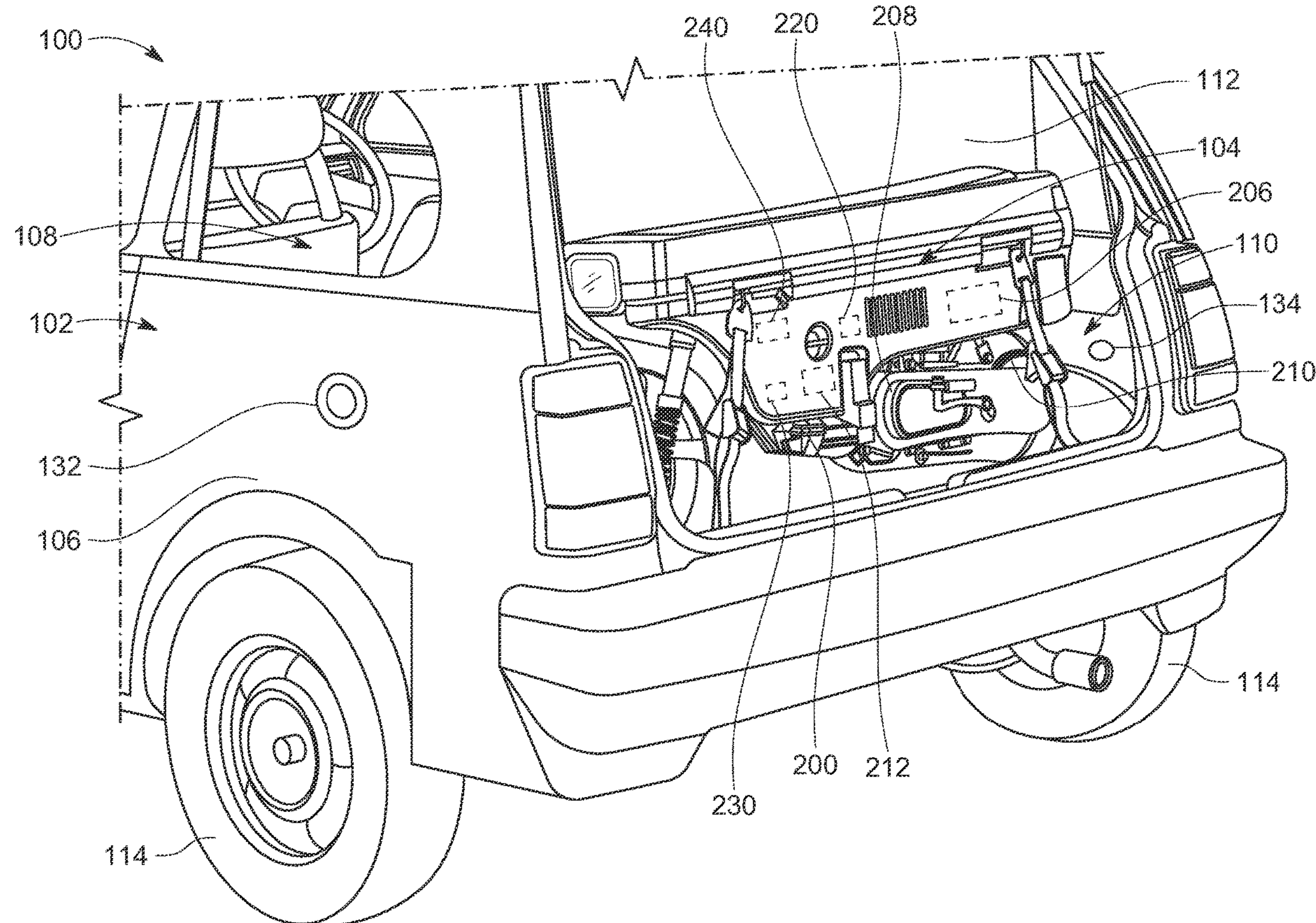
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(57)

**ABSTRACT**

An electric vehicle including a storage compartment adapted to store a saddle riding vehicle having an engine and a generator adapted to be selectively coupled to the engine to produce electric power. The electric vehicle includes at least one electric motor, at least one rechargeable battery electrically coupled to the at least one electric motor, and at least one charging port to facilitate a charging of the at least one battery. The electric vehicle also includes a switch to start the engine of the saddle riding vehicle and a controller configured start the engine of the saddle riding vehicle to recharge the at least one battery when the at least one charging port is electrically coupled to the generator, the generator is coupled to the engine of the saddle riding vehicle, and the switch is operated to start the engine of the saddle riding vehicle.



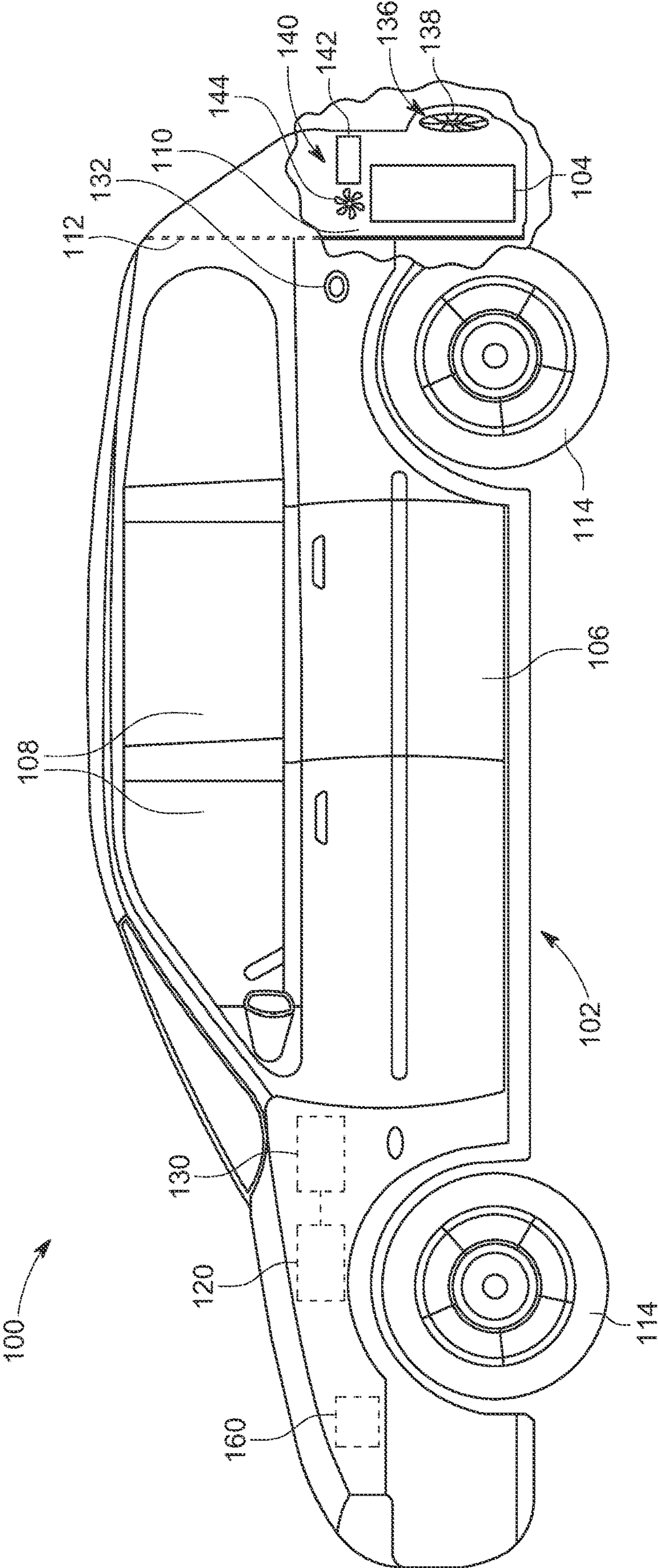
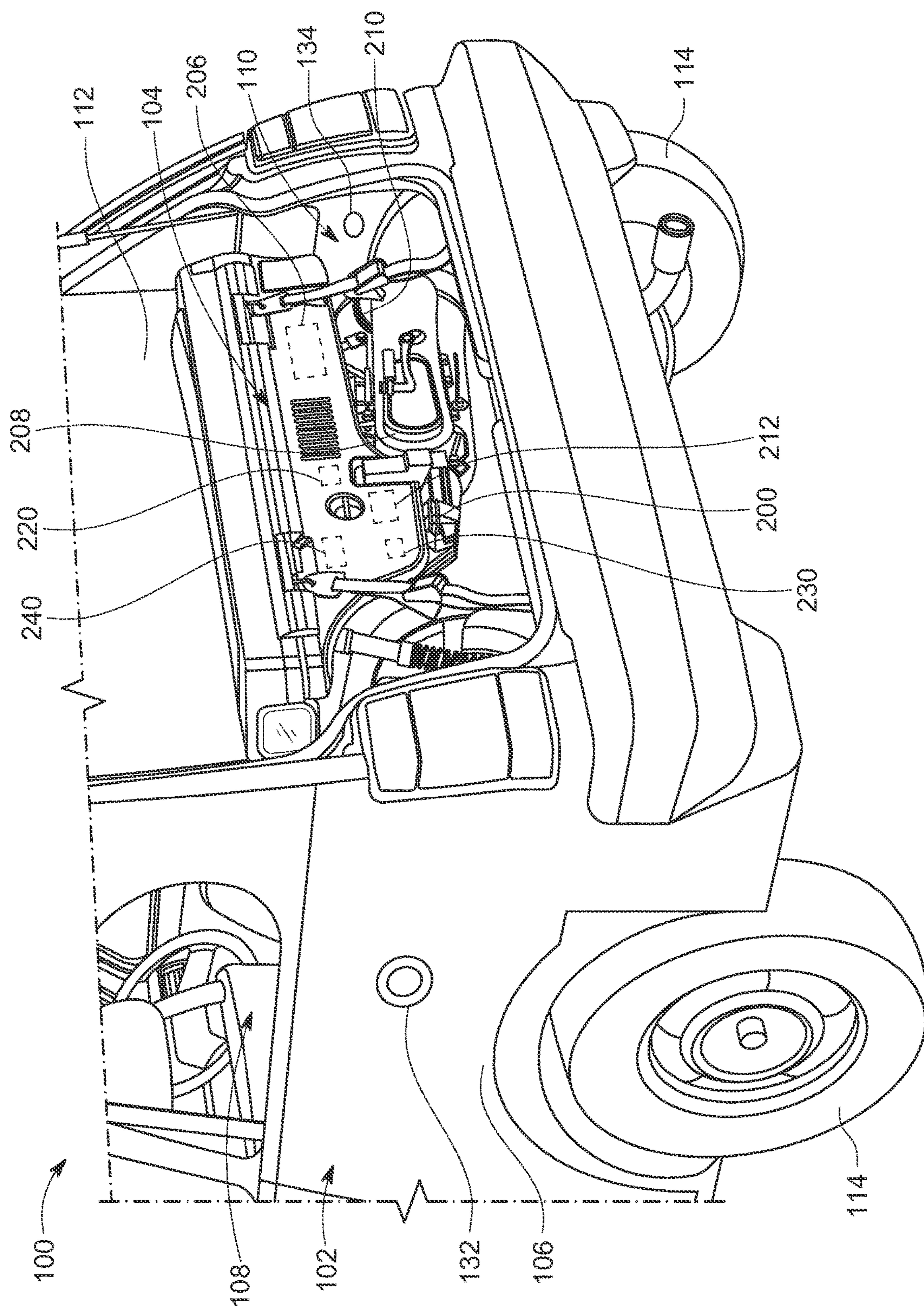


FIG. 1







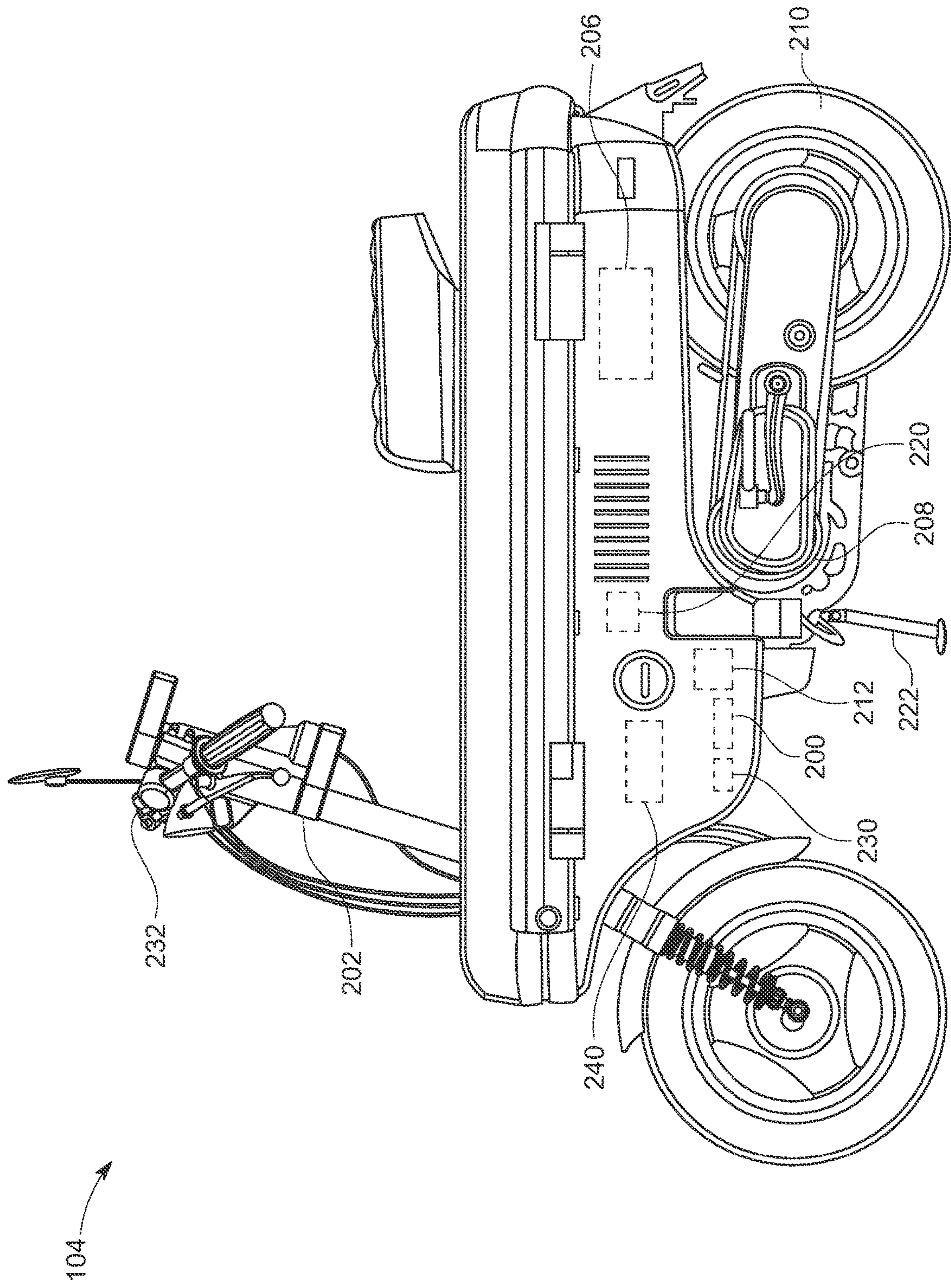


FIG. 3

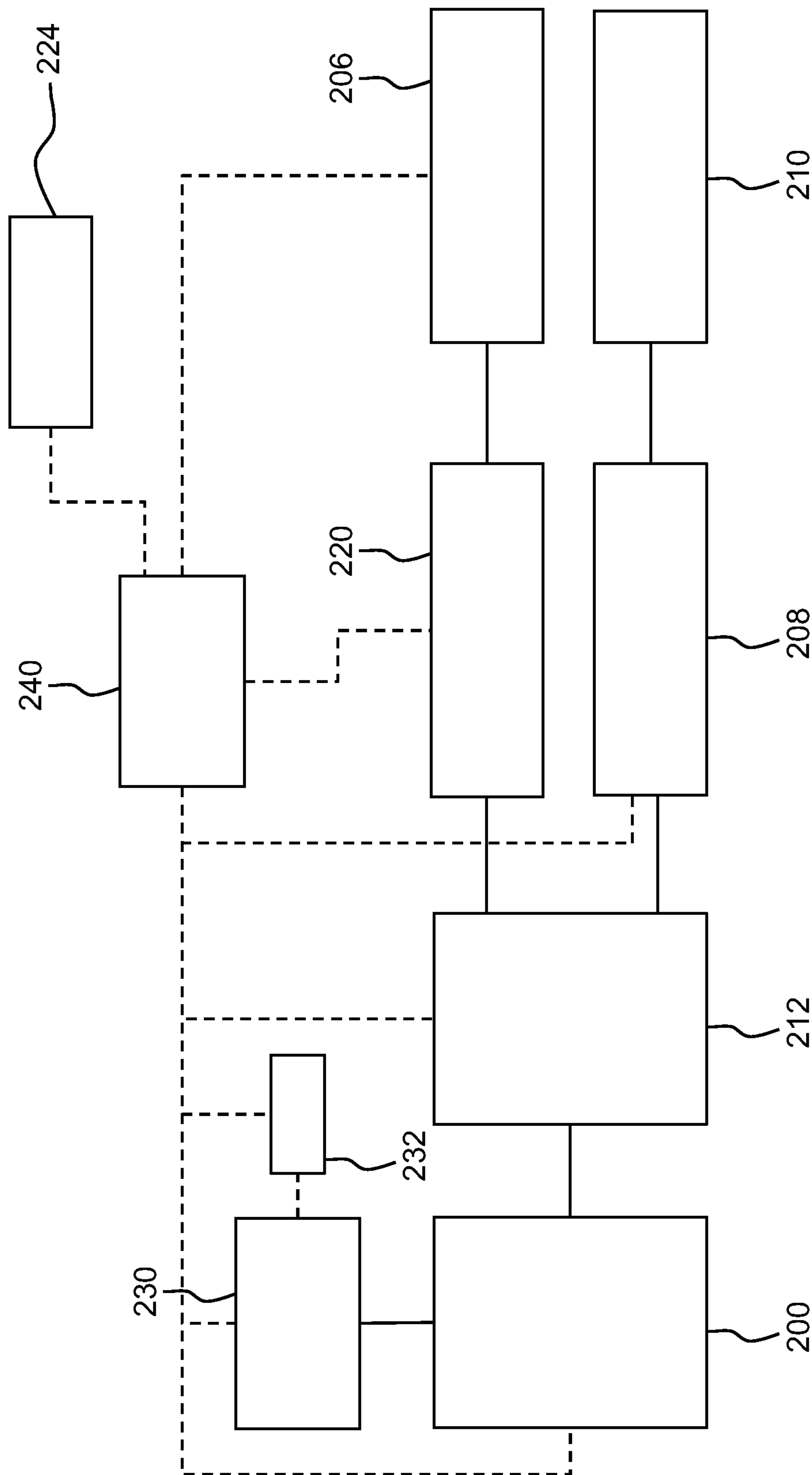
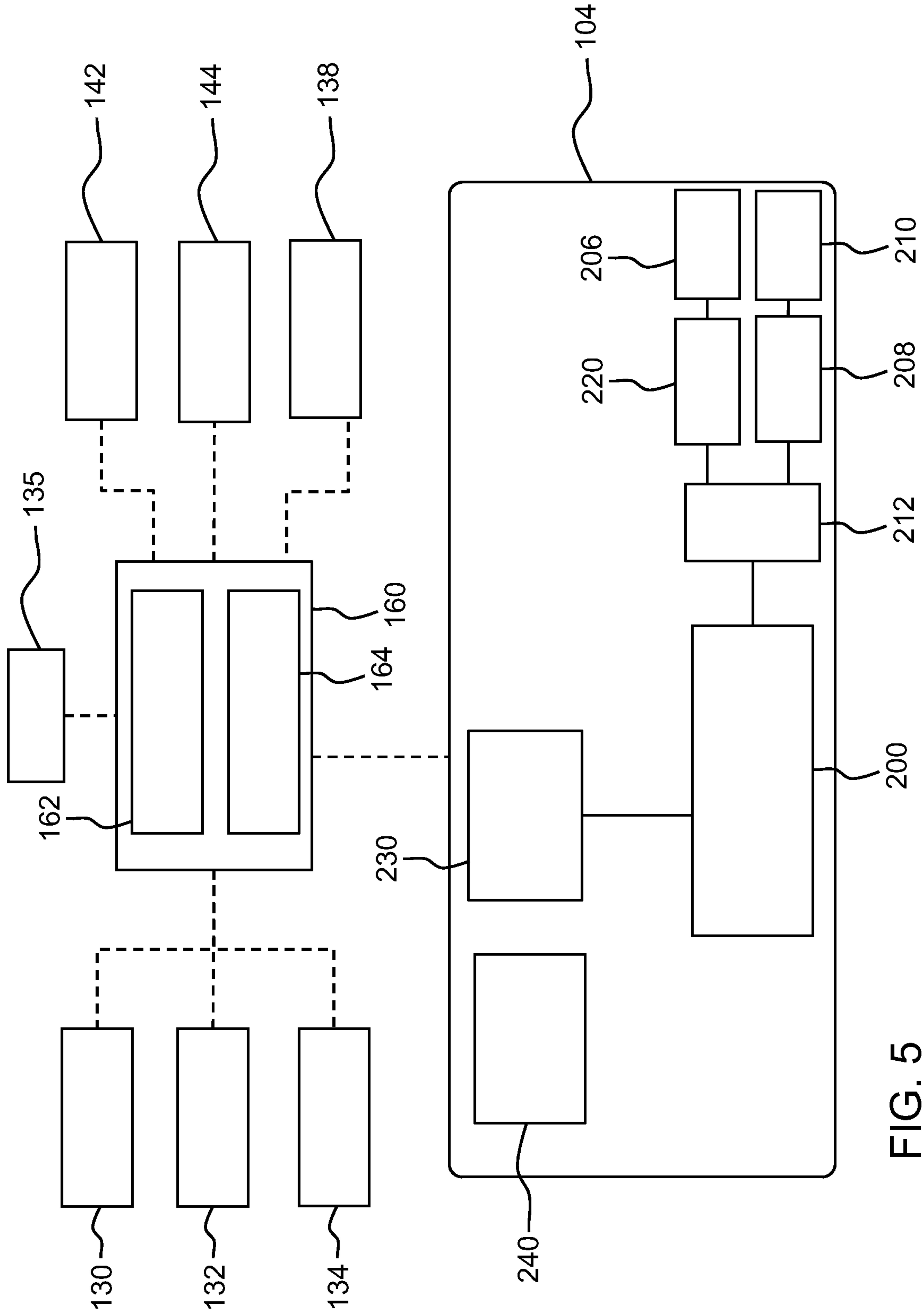


FIG. 4





**ELECTRIC VEHICLE****BACKGROUND**

**[0001]** The disclosed subject matter relates generally to an electric vehicle. More particularly, the disclosed subject matter relates to a vehicle assembly having an electric vehicle with a storage compartment and a saddle riding vehicle adapted to be arranged inside the storage compartment and suitable to charge the electric vehicle.

**[0002]** Electric vehicles, generally, provide limited mobility or utility for accessing off-road locations, for example, forests, hills, camping sites etc. To a large extent, the capabilities of the electric vehicles are limited at these locations due to unavailability of charging infrastructure for charging the electric vehicles. Therefore, there is a need for a system for charging the electric vehicle and provide last mile connectivity.

**SUMMARY**

**[0003]** In accordance with one embodiment of the present disclosure, an electric vehicle is provided. The electric vehicle includes a car body defining a passenger compartment and a storage compartment adapted to store a saddle riding vehicle having an engine and a generator adapted to be selectively coupled to the engine to produce electric power. The electric vehicle further includes a plurality of traction members supporting the car body, at least one electric motor operatively coupled to the plurality of traction members and configured to drive the plurality of traction members, and at least one rechargeable battery electrically coupled to the at least one electric motor to provide electric power to the at least one electric motor. The electric vehicle also includes at least one charging port to facilitate a charging of the at least one battery, and a switch adapted to be manually operated to start the engine of the saddle riding vehicle. Moreover, the electric vehicle includes a controller arranged in communication with the at least one charging port, and the switch, and is adapted to be arranged in communication with the saddle riding vehicle. The controller is configured to detect an electrical coupling of the at least one charging port with the generator of the saddle riding vehicle and determine a coupling of the generator with the engine. The controller is configured to start the engine of the saddle riding vehicle to recharge the at least one battery when the at least one charging port is electrically coupled to the generator, the generator is coupled to the engine of the saddle riding vehicle, and the switch is operated to start the engine of the saddle riding vehicle.

**[0004]** In accordance with one embodiment of the present disclosure, a vehicle assembly is disclosed. The vehicle assembly includes a saddle riding vehicle and an electric vehicle. The saddle riding vehicle has an engine and a generator selectively coupled to the engine to produce electric power. The electric vehicle includes a car body defining a passenger compartment and a storage compartment configured to store the saddle riding vehicle, a plurality of traction members supporting the car body, and at least one electric motor operatively coupled to the plurality of traction members and configured to drive the plurality of traction members. The electric vehicle also includes at least one rechargeable battery electrically coupled to the at least one electric motor to provide electric power to the at least one electric motor. Moreover, the electric vehicle includes at

least one charging port to facilitate a charging of the at least one battery and a switch adapted to be manually operated to start the engine of the saddle riding vehicle. Furthermore, the electric vehicle includes a controller arranged in communication with the at least one charging port, the at least one battery, and the switch, and is adapted to communicate with the saddle riding vehicle. The controller is configured to detect an electrical coupling of the at least one charging port with the generator of the saddle riding vehicle and determine a coupling of the generator with the engine. Further, the controller is configured to start the engine of the saddle riding vehicle to recharge the at least one battery when the at least one charging port is electrically coupled to the generator, the generator is coupled to the engine of the saddle riding vehicle, and at least one of the switch is operated to start the engine of the saddle riding vehicle or a charge of the at least one battery is below a predefined value.

**[0005]** In accordance with yet further embodiment of the present disclosure, an electric vehicle is disclosed. The electric vehicle includes a car body defining a passenger compartment and a storage compartment adapted to store a saddle riding vehicle having an engine and a generator adapted to be selectively coupled to the engine to produce electric power, a plurality of traction members supporting the car body, and at least one electric motor operatively coupled to the plurality of traction members and configured to drive the plurality of traction members. The electric vehicle also includes at least one rechargeable battery electrically coupled to the at least one electric motor to provide electric power to the at least one electric motor, at least one charging port to facilitate a charging of the at least one battery, and a switch adapted to be manually operated to start the engine of the saddle riding vehicle. Moreover, the electric vehicle includes a controller arranged in communication with the at least one charging port, the at least one battery and the switch, and is adapted to be arranged in communication with the saddle riding vehicle. The controller is configured to detect an electrical coupling of the at least one charging port with the generator of the saddle riding vehicle and determine a coupling of the generator with the engine. Further, the controller is configured to start the engine of the saddle riding vehicle to recharge the at least one battery in response to the at least one charging port is electrically coupled to the generator, the generator is coupled to the engine of the saddle riding vehicle, and at least one of the switch is operated to start the engine of the saddle riding vehicle or a charge of the at least one battery is below a predefined value.

**BRIEF DESCRIPTION OF THE DRAWINGS**

**[0006]** Certain embodiments of the present disclosure will be better understood from the following description taken in conjunction with the accompanying drawings in which:

**[0007]** FIG. 1 is a schematic view of a vehicle assembly having an electric vehicle and a saddle riding vehicle arranged inside a storage compartment of the electric, in accordance with one embodiment of the present disclosure;

**[0008]** FIG. 2 is perspective view of a rear portion of the electric vehicle having the saddle riding vehicle arranged inside the storage compartment of the electric, in accordance with one embodiment of the present disclosure;

**[0009]** FIG. 3 is a side view of the saddle riding vehicle of FIG. 2, in accordance with one embodiment of the present disclosure;



[0010] FIG. 4 is a schematic view of various components of the saddle riding vehicle of FIG. 3 depicting a control unit arranged in communication with various components of the saddle riding vehicle, in accordance with one embodiment of the present disclosure; and

[0011] FIG. 5 is a schematic view depicting a controller of the electric vehicle arranged in communication with the saddle riding vehicle and various components of the electric vehicle, in accordance with one embodiment of the present disclosure.

#### DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0012] A few inventive aspects of the disclosed embodiments are explained in detail below with reference to the various figures. Exemplary embodiments are described to illustrate the disclosed subject matter, not to limit its scope, which is defined by the claims. Those of ordinary skill in the art will recognize a number of equivalent variations of the various features provided in the description that follows. Embodiments are hereinafter described in detail in connection with the views and examples of FIGS. 1-5 wherein like numbers indicate the same or corresponding elements throughout the views.

[0013] Referring to FIG. 1 and FIG. 2, a vehicle assembly 100 having a four wheeled electric vehicle 102 (hereinafter referred to as vehicle 100) and a straddle riding vehicle 104 arranged inside a storage compartment 110 of the vehicle 102 is shown. The vehicle 102 includes a car body 106 defining at least one passenger compartment 108 to facilitate a seating of at least one person inside the vehicle 102 and the storage compartment 110 to allow a storage of one or more article inside the vehicle 102. The storage compartment 110 and the passenger compartment 108 are separated from each other via a partition wall 112. As shown, the vehicle 102 includes a plurality of traction members, for example, wheels 114, supporting the car body 106 on a surface and enables a movement of the vehicle 102 on the surface. Although the vehicle 102 including four wheels are shown, it may be appreciated that the vehicle 100 may include more than four wheels.

[0014] Further, as shown in FIG. 1, the vehicle 102 includes at least one electric motor 120 operatively coupled to the wheels 114 and configured to provide power to the wheels 114. To operate the at least one electric motor 120 and provide electric power to the at least one electric motor 120, the vehicle 102 includes at least one battery 130. Further, the at least one battery 130 is adapted to provide power to additional components of the vehicle 102. It may be appreciated that the at least one battery 130 is a rechargeable battery, and is adapted to be recharged by an external electric power source by connecting the at least one battery 130 to the external electric power source via a suitable charger. To enable a removable connection of the charger with the vehicle 102 (i.e., the battery 130), the vehicle 102 may include at least one charging port, for example, a first charging port 132 and a second charging port 134 (shown in FIG. 2). In an embodiment, the first charging port 132 may be located at an exterior surface of the vehicle 102, while the second charging port 134 may be arranged/disposed/located inside the storage compartment 110 to facilitate the charging of the at least one battery 130 with the straddle riding vehicle 104 stored/arranged/disposed inside the storage compartment 110. Further, the vehicle 102 may include a switch 135

(shown in FIG. 5), for example, an engine start stop button, adapted to be manually operated to start and stop an engine 200 of the saddle riding vehicle 104 for recharging the at least one battery 130 of the vehicle 102 when the saddle riding vehicle is arranged/stored inside the storage compartment 110.

[0015] To facilitate the operation of the engine operated straddle riding vehicle 104 inside the storage compartment 110, and the vehicle 102 may include a ventilation system 136 to vent out any exhaust gas, generated during the operation of the engine 200 of the straddle riding vehicle 104, from the storage compartment 110 to an ambient (i.e., environment). Accordingly, the ventilation system 136 may include at least one exhaust fan 138 adapted to create a suction inside the storage compartment 110 to remove exhaust gas from the storage compartment.

[0016] Additionally, the vehicle 102 may include a temperature control system 140 (shown in FIGS. 1 and 5) for maintaining a temperature inside the storage compartment 110 below a predefined value. In an embodiment, the temperature control system 140 includes at least one temperature sensor 142 configured to measure/monitor/detect/determine temperature inside the storage compartment 110, and at least one cooling fan 144 to blow a cool air inside the storage compartment 110 to maintain the temperature below the threshold temperature. In an embodiment, the at least one cooling fan 144 is actuated based on the input from the at least one temperature sensor 142. In some embodiments, the at least one fan may be actuated upon starting of the engine 200 of the straddle riding vehicle 104 irrespective of the temperature inside the storage compartment 110, and the cooling fan 144 keeps operating till the engine 200 of the straddle riding vehicle 104 is running. In some embodiments, the at least one cooling fan 144 may be actuated based on the temperature and the operation of the engine 200 of the straddle riding vehicle 104.

[0017] Referring to FIGS. 2 and 3, the straddle riding vehicle 104 is shown. The straddle riding vehicle 104 may be a foldable vehicle to facilitate a storage of the straddle riding vehicle 104 inside the storage compartment 110. Although the straddle riding vehicle 104 is shown and contemplated as a foldable vehicle, it may be envisioned that other non-foldable straddle type vehicles are within the scope of the disclosure. As shown, the straddle riding vehicle 104 includes a handle 202 that is adapted to move to a folded position (shown in FIG. 2) to enable the storage/positioning of the straddle riding vehicle 104 inside the storage compartment, 110 and a straight position (shown in FIG. 3) to enable a driving of the straddle riding vehicle 104 on a road by a rider.

[0018] The straddle riding vehicle 104 includes the engine 200 to facilitate the generation of a power, a generator 206 operatively and removably coupled to the engine 200 and configured to generate electric power, a transmission unit 208 operatively and removably coupled to the engine 200 and configured to transmit motive power to a rear wheel 210 of the straddle riding vehicle 104 to enable a movement of the straddle riding vehicle 104 over a path, and a drive selector 212 to selectively couple the transmission unit 208 (i.e., rear wheel 210) or the generator 206 to the engine 200. In an embodiment, the straddle riding vehicle 104 may include a power generation gear unit 220 arranged between the drive selector 212 and the generator 206 and configured to control a torque and speed being transferred to the



generator **206** from the engine **200**. In an embodiment, the generator **206** may be a DC generator to facilitate the generation of electric current. In an embodiment, the generator **206** may be a self-excited DC generator or a separately excited DC generator for facilitating the generation of the electric current.

[0019] Additionally, in an embodiment, the drive selector **212** is moved between a first position and a second position by manually operating a switch (not shown) that may be arranged on the handle **202** of the straddle riding vehicle **104**. In the first position, the drive selector **212** is engaged with transmission unit **208**, while in the second position the drive selector **212** is engaged with the power generator gear unit **220**, hence the generator **206**. Accordingly, the engine **200** is operatively coupled to the transmission unit **208** when the drive selector **212** is arranged in the first position, thereby enabling a transfer of power from the engine **200** to the rear wheel **210**, while the engine **200** is operatively coupled to the generator **206** for the generating the electric power when the drive selector **212** is arranged in the second position. In some embodiments, the drive selector **212** is normally arranged at the first position, and is moved to the second position, by a control unit or a controller, in response to the detection of a connection of the generator **206** to the least one charging port, for example, the second charging port **134** via the charger when the saddle riding vehicle **104** is arranged/stored inside the storage compartment **110**. Additionally, or optionally, the drive selector **212** may be moved to the second position when the transmission unit **208** is in a neutral position. In an embodiment, the saddle riding vehicle **104** may include a sensor (not shown) to determine the position/status of the transmission unit **208**.

[0020] Further, the saddle riding vehicle **104** may include an engine starter **230**, for example, an electric motor, to crank and start the engine **200**. In an embodiment, the engine starter may be configured to be actuated by actuation of a button **232** mounted on the saddle riding vehicle **104**. In some embodiments, the saddle riding vehicle **104** may include a control unit **240** (shown in FIGS. 2, 3 and 4), for example, an electronic control unit, arranged in communication with the drive selector **212**, the sensor, the transmission unit **208**, the generator **206**, the engine **200** and the engine starter **230**, and is configured to control drive selector **212**, the transmission unit **208**, the generator **206**, the engine, the engine starter **230**, and other component of the saddle riding vehicle **104**. In an embodiment, the control unit **240** may be configured to control the starting of the engine **200** to operate the generator **206** based on data received from the drive selector **212**, the transmission unit **208**, the engine starter **230**, etc. For example, when the drive selector **212** is in the second position, the control unit **240** is configured to allow the starting of the engine **200** to start the generator **206** when the transmission unit **208** is in the neutral position. In some embodiments, the control unit **240** may determine whether a stand **222** (shown in FIG. 3) of the saddle riding vehicle **104** in an upright position or not before starting the engine **200** to operate the generator **206**. In such a case, the control unit **240** may start the engine **200** only when the transmission unit **208** is in the neutral position and the stand is in the upright position. For detecting if the stand **222** is in the upright position, the saddle riding vehicle **104** may include a stand sensor **224** arranged in communication with the control unit **240**.

[0021] Referring to FIG. 5, the vehicle may include a controller **160** to control the operation of the saddle riding vehicle **104** for recharging the at least one battery **130** of the vehicle **102** when the saddle riding vehicle **104** is arranged inside the storage compartment **110**. For recharging the at least one battery **130**, the generator **206** of the vehicle **102** is electrically connected to the second charging port **134**. Also, the controller **160** is configured to communicate with the engine starter **230**, the drive selector **212**, and the transmission unit **208**, and control the operation of the engine **200** based on one or more inputs from the components of the saddle riding vehicle **104** upon connection of the saddle riding vehicle **104** with the electric vehicle **102**. In an embodiment, the controller **160** detects the connection of the saddle riding vehicle **104** with the electric vehicle **102** when the second charging port **134** is electrically coupled to the generator **206** via the charger. Further, the controller **160** is also arranged in communication with the at least one exhaust fan **138**, the temperature sensor **142**, and the at least one cooling fan **144** and control the at least one exhaust fan **138** and the at least one cooling fan **144**.

[0022] As shown in FIG. 5, the controller **160** may include a processor **162** for executing specified instructions, which controls and monitors various functions associated with the saddle riding vehicle **104** and the electric vehicle **102**. The processor **162** may be operatively connected to a memory **164** for storing instructions related to the functioning and recharging of the electric vehicle **102** and the saddle riding vehicle **104**. In an embodiment, the memory **164** may also store various events performed during the operations of the saddle riding vehicle **104** during the recharging of the electric vehicle **102**.

[0023] As shown, the memory **164** as illustrated is integrated into the controller **160**, but those skilled in the art will understand that the memory **164** may be separate from the controller **160** or remote from the controller **160**, while still being associated with and accessible by the controller **160** to store information in and retrieve information from the memory **164** as necessary. Although the processor **162** is defined, it is also possible and contemplated to use other electronic components such as a microcontroller, an application-specific integrated circuit (ASIC) chip, or any other integrated circuit device that may be used for performing a similar function. Moreover, the controller **160** may refer collectively to multiple control and processing devices across which the functionality of the saddle riding vehicle **104** and the electric vehicle **102** may be distributed.

[0024] The controller **160** is configured to determine the connection of the at least one battery **130** to the generator **206** of the saddle riding vehicle **104** via the charger. In an embodiment, the controller **160** determines the connection of the at least one battery **130** with the generator **206** upon connecting the at least one charging port, for example, the second charging port **134** with the generator **206**. Moreover, the controller **160** may determine a presence of the saddle riding vehicle **104** inside the storage compartment **110** with the help of suitable sensors.

[0025] Further, the controller **160**, in response, to receipt of a start request for starting the engine **200**, is configured to check a plurality of parameters associated with the saddle riding vehicle **104**. In an embodiment, the controller **160** may receipt the request for starting the engine **200** when a switch **135**, for example, a start-stop button, mounted inside the vehicle **102** is actuated by a user of the vehicle **102**. In



some embodiments, the controller **160** may be arranged in communication with the at least one battery **130** and is configured to determine a charge level of the at least one battery **130**. In response to the determination that the charge level of the at least one battery **130** is below a predefined value, the controller **160** is configured to determine that the request for starting of the engine **200** of the straddle riding vehicle **104** to charge the at least one battery **130** is received.

[0026] Upon determining a request for charging the at least one battery **130**, the controller **160** may determine a position of the drive selector **212**. In an embodiment, the controller **160** is configured to start the engine **200** if the drive selector **212** is in the second position. In a scenario, the controller **160** may determine that the drive selector **212** is disposed in the first position. In such a case, the controller **160** may shift the drive selector **212** to the second position before starting the engine **200**. In some embodiments, instead of the automatically shifting the drive selector **212** to the second position, the controller **160** may generate an alert/alarm to inform the driver of the vehicle **102** that drive selector **212** is to be shifted to the second position. In such a scenario, the controller **160** starts the engine **200** in response to the shifting of the drive selector **212** to the second position by the driver. In some embodiments, before starting the engine **200** of the saddle riding vehicle **104**, the controller **160** may be configured determine a status of the transmission unit **208** and starts the engine **200** when the transmission unit **208** is in the neutral position. In this manner, the controller **160** facilitates a charging of the at least one battery **130** when the saddle riding vehicle **104** is arranged inside the storage compartment **110** of the vehicle **102** to provide a last mile connectivity.

[0027] Additionally, the controller **160** may control and actuate the at least one exhaust fan **138** to remove the exhaust gas, discharged by the engine **200**, from the storage compartment **110** to an outside of the vehicle **102** upon detection of the start of the engine **200** and when the saddle riding vehicle **104** is arranged inside the storage compartment **110**. Also, the controller **160** may initiate/actuate/start the at least one cooling fan **144** based on input from the temperature sensor **142**. In some embodiments, the controller **160** may actuate the at least one cooling fan **144** when the engine **200** is started to recharge the at least one battery **130**. In this manner, the at least one battery **130** of the vehicle **102** is charged for moving the vehicle **102** and providing last mile connectivity.

[0028] In another example embodiment, the at least one battery **130** may be charged when the saddle riding vehicle **104** is arranged/disposed outside the vehicle **102**. In such a case, the control unit **240** controls the starting of the engine **200** to charge the at least one battery **130**. In this example embodiment, the control unit **240** may determine the position of the drive selector **212** and a position/status of the transmission unit **208** before starting the engine **200** for recharging the at least one battery **130**. The control unit **240** is configured to allow the start of the engine **200** if the transmission unit **208** is in the neutral position upon determination that the drive selector **212** is in the second position to recharge the at least one battery **130** by via the generator **206**. Additionally, the control unit **240** is configured to detect a position of the stand **222** of the saddle riding vehicle **104**, and starts the engine **200** when the stand **222** is an upright position upon determination that the drive selector **212** is in the second position and the transmission unit **208** is in the

neutral position. In this manner, the electric vehicle **102** is charged. Moreover, the saddle riding vehicle **104** can be taken along with the electric vehicle **102** for a leisure activity, for example, to visit a remote location during camping. Moreover, the saddle riding vehicle **104** can be used to provide electricity at the camp site.

What is claimed is:

1. An electric vehicle, comprising:

- a car body defining a passenger compartment and a storage compartment adapted to store a saddle riding vehicle having an engine and a generator adapted to be selectively coupled to the engine to produce electric power;
- a plurality of traction members supporting the car body;
- at least one electric motor operatively coupled to the plurality of traction members and configured to drive the plurality of traction members;
- at least one rechargeable battery electrically coupled to the at least one electric motor to provide electric power to the at least one electric motor;
- at least one charging port to facilitate a charging of the at least one battery;
- a switch adapted to be manually operated to start the engine of the saddle riding vehicle; and
- a controller arranged in communication with the at least one charging port, and the switch, and is adapted to be arranged in communication with the saddle riding vehicle, the controller is configured to
  - detect an electrical coupling of the at least one charging port with the generator of the saddle riding vehicle,
  - determine a coupling of the generator with the engine, and
  - start the engine of the saddle riding vehicle to recharge the at least one battery when
    - the at least one charging port is electrically coupled to the generator,
    - the generator is coupled to the engine of the saddle riding vehicle, and
    - the switch is operated to start the engine of the saddle riding vehicle.

2. The electric vehicle of claim 1, wherein the controller is configured to start the engine when a transmission unit of the saddle riding vehicle is in a neutral position, wherein the transmission unit is operatively coupled to a rear wheel of the saddle riding vehicle.

3. The electric vehicle of claim 1, wherein the car body includes a partition wall separating the storage compartment from the passenger compartment.

4. The electric vehicle of claim 1 further including at least one exhaust fan to facilitate a removal of exhaust gas, discharged by the engine of the saddle riding vehicle, from the storage compartment.

5. The electric vehicle of claim 4, wherein the controller is configured to actuate the at least one exhaust fan in response to the starting of the engine of the saddle riding vehicle.

- 6. The electric vehicle of claim 1 further including
  - a temperature sensor to determine a temperature inside the storage compartment,
  - and
  - at least one cooling fan to facilitate a flow of air inside the storage compartment.



7. The electric vehicle of claim 6, wherein the controller is configured to actuate the cooling fan based on an input from the temperature sensor.

8. A vehicle assembly, comprising:

a saddle riding vehicle including an engine, and a generator selectively coupled to the engine to produce electric power; and an electric vehicle including

a car body defining a passenger compartment and a storage compartment configured to store the saddle riding vehicle,

a plurality of traction members supporting the car body, at least one electric motor operatively coupled to the plurality of traction members and configured to drive the plurality of traction members,

at least one rechargeable battery electrically coupled to the at least one electric motor to provide electric power to the at least one electric motor,

at least one charging port to facilitate a charging of the at least one battery,

a switch adapted to be manually operated to start the engine of the saddle riding vehicle, and

a controller arranged in communication with the at least one charging port, the at least one battery, and the switch, and is adapted to communicate with the saddle riding vehicle, the controller is configured to detect an electrical coupling of the at least one charging port with the generator of the saddle riding vehicle,

determine a coupling of the generator with the engine, and

start the engine of the saddle riding vehicle to recharge the at least one battery when

the at least one charging port is electrically coupled to the generator,

the generator is coupled to the engine of the saddle riding vehicle, and

at least one of the switch is operated to start the engine of the saddle riding vehicle or a charge of the at least one battery is below a predefined value.

9. The vehicle assembly of claim 8, wherein the saddle riding vehicle includes

a transmission unit selectively coupled to the engine, wherein the transmission unit is operatively coupled to a rear wheel of the saddle riding vehicle, and

a drive selector adapted to selectively couple the transmission unit or the generator to the engine.

10. The vehicle assembly of claim 9, wherein the drive selector is adapted to be arranged in a first position and a second position, wherein

in the first position, the drive selector couples the engine to the transmission unit, and

in the second position, the drive selector couples the engine to the generator.

11. The vehicle assembly of claim 9, wherein the controller is configured to start the engine when the transmission unit of the saddle riding vehicle is in a neutral position.

12. The vehicle assembly of claim 8, wherein the car body includes a partition wall separating the storage compartment from the passenger compartment.

13. The vehicle assembly of claim 8, wherein the electric vehicle includes at least one exhaust fan to facilitate a

removal of exhaust gas, discharged by the engine of the saddle riding vehicle, from the storage compartment.

14. The vehicle assembly of claim 13, wherein the controller is configured to actuate the at least one exhaust fan in response to the starting of the engine of the saddle riding vehicle.

15. The vehicle assembly of claim 8, wherein the electric vehicle includes

a temperature sensor to determine a temperature inside the storage compartment,

and

at least one cooling fan to facilitate a flow of air inside the storage compartment.

16. An electric vehicle, comprising:

a car body defining a passenger compartment and a storage compartment adapted to store a saddle riding vehicle having an engine and a generator adapted to be selectively coupled to the engine to produce electric power;

a plurality of traction members supporting the car body; at least one electric motor operatively coupled to the plurality of traction members and configured to drive the plurality of traction members;

at least one rechargeable battery electrically coupled to the at least one electric motor to provide electric power to the at least one electric motor;

at least one charging port to facilitate a charging of the at least one battery;

a switch adapted to be manually operated to start the engine of the saddle riding vehicle; and

a controller arranged in communication with the at least one charging port, the at least one battery and the switch, and is adapted to be arranged in communication with the saddle riding vehicle, the controller is configured to

detect an electrical coupling of the at least one charging port with the generator of the saddle riding vehicle,

determine a coupling of the generator with the engine, and

start the engine of the saddle riding vehicle to recharge the at least one battery in response to

the at least one charging port is electrically coupled to the generator,

the generator is coupled to the engine of the saddle riding vehicle,

and

at least one of the switch is operated to start the engine of the saddle riding vehicle or a charge of the at least one battery is below a predefined value.

17. The electric vehicle of claim 16, wherein the controller is configured to start the engine when a transmission unit of the saddle riding vehicle is in a neutral position, wherein the transmission unit is operatively coupled to a rear wheel of the saddle riding vehicle.

18. The electric vehicle of claim 16, wherein the car body includes a partition wall separating the storage compartment from the passenger compartment.

19. The electric vehicle of claim 16 further including at least one exhaust fan to facilitate a removal of exhaust gas, discharged by the engine of the saddle riding vehicle, from the storage compartment, and

the controller is configured to actuate the at least one exhaust fan in response to the starting of the engine of the saddle riding vehicle.

**20.** The electric vehicle of claim **16** further including  
a temperature sensor to determine a temperature inside the  
storage compartment,  
at least one cooling fan to facilitate a flow of air inside the  
storage compartment.

\* \* \* \* \*